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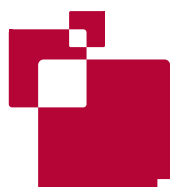
Highlights

- In its Digital Single Market strategy, the European Commission has rightly noted the importance of reducing the price paid for basic cross-border parcel delivery by consumers and by small and medium size retail senders.
- The payment flows for cross-border parcel delivery are strikingly similar to those for telecommunications. Comparisons with roaming can be instructive. As with roaming, it is clear that the links between wholesale payments between the national postal operators and retail prices need to be properly understood in order to craft good policy. Another useful lesson is that national postal regulatory authorities are unlikely to address cross-border problems because of limitations in their respective mandates and because they have no incentive to take measures to benefit residents of other countries.
- There are also significant differences between roaming and parcel delivery. While high wholesale charges were a major driver of high retail prices for international mobile roaming, the wholesale payments for cross-border parcel delivery appear to be below cost. This implies that it is the 'spread' between retail price and the wholesale payment that is inflated, at least for small retail senders and for consumers.
- Comprehensive statistics gathering, coordinated at European level, is indispensable.

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1 INTRODUCTION

The expansion of e-commerce represents a substantial growth opportunity for Europe. The ability of Europe to fully capitalise on this opportunity appears however to be limited by the high prices paid for the shipment of goods across national boundaries within the European Union. In its Digital Single Market (DSM) strategy (European Commission, 2015) and elsewhere, the European Commission has repeatedly signalled its intent to reduce cross-border parcel delivery prices and to increase the transparency of retail pricing for cross-border delivery services, an initiative that we consider to be on target.

In this, our concern is with basic cross-border delivery services, not with express or courier services; our primary focus is on business-to-consumer (B2C) shipments rather than business-to-business (B2B); and the concern is far greater for shipments by consumers, micro-enterprises, and small and medium enterprises (SMEs) than for large-scale senders. Our focus is on the national postal operators (NPOs), who continue to play a major role in these cross-border shipments. This has also been the Commission's central focus in its DSM initiative.

Cross-border purchasing is also growing in terms of the revenues generated and in terms of the number of consumers who order across borders. Eurostat data confirms that 65 percent of Internet users shopped online in 2015, and that "... 30 percent of online shoppers bought or ordered goods or services from sellers in other EU countries. ... A rising trend is observed for purchases from sellers in other member states (from 25 percent in 2012 to 30 percent in 2015) and from sellers outside the EU (from 13 percent in 2012 to 18 percent in 2015)" (Eurostat, 2016). FTI Consulting in 2011 had already found that "distance sales and e commerce represent 7 percent and 5 percent of [EU] retail turnover [respectively], a mere 1 percent of which is generated cross-border for each activity"¹.

Parcel delivery clearly facilitates this e-commerce. Of the €477 billion in e-commerce purchases in Europe in 2015, 53 percent was purchases of goods, 47 percent was purchases of services (E-commerce Europe, 2015). The goods clearly had to be delivered somehow.

The role of micro-, small and medium enterprise should be of particular interest to Europe, inasmuch as many of the large parcel-delivery companies are headquartered in the United States. US operators were much quicker and much more effective to recognise and capitalise on the opportunities of e-commerce. Nevertheless, there is a clear interest in ensuring that European firms, which already face an uphill slog in many cases because of small home markets and lack of brand recognition, are not further disadvantaged by incoherent European policy². Based on Eurostat and other statistics, "15 percent of SMEs sell online compared with 35 percent of large enterprises; 7 percent of SMEs sell across borders compared with 21 percent of large enterprises"³.

1.1 Cross-border e-commerce is a growth opportunity for the EU

Online purchasing is growing rapidly within the European Union, as elsewhere, generating benefits for broader European society. The European Commission (2015) reported that online sale of goods in the EU was increasing "at an average annual growth rate of 22 percent, surpassing €200 billion in 2014 and reaching a share of 7 percent of total retail sales". Of particular interest are business-to-consumer (B2C) activities. In 2012, B2C e-commerce in the EU28 (reflecting the sum of goods and services purchased online) grew by 18 percent to reach €276.5 billion (Brune, 2013).

1. FTI (2011); study completed for the European Commission (DG Enterprise).

2. See FTI (2011): "[S]mall senders (individuals, micro and small enterprises) ... either pay full price (as published in the publicly available price list of the delivery operator), or obtain small discounts on both domestic and cross-border products ...".

3. EurActiv and Digital Europe (2016). See also European Commission (2015): "While 17 percent of SMEs in the EU sell online (which is already very low), only 7 percent sell cross-border to other EU countries".

1.2 What forms of cross-border parcel delivery might be subject to high pricing?

In the case of express or courier services, the presence of multiple vertically integrated providers makes it likely that their prices are competitive. Most e-commerce does not travel this way, however, because these services tend to be too expensive, and because not all shipments require such rapid delivery (European Commission, 2013).

Large retailers are aware of and able to exploit multiple parcel delivery channels (including self-provision, especially in dense metropolitan areas where their volume of shipments is high enough). It can be safely assumed that the largest retailers optimise their use of delivery services so that each shipment is delivered from the most suitable fulfilment centre, over the most suitable service. They probably pay less for cross-border parcel delivery than small-scale retailers and individuals. At the same time, it can be assumed that even the largest retailers are dependent on the national postal operators (NPOs⁴ to deliver to low density areas. How much the large retailers are disadvantaged by cross-border parcel delivery prices is simply not known.

Small retailers, especially micro-enterprises and SMEs, probably have fewer alternatives to the standard national postal operators (or they may be less aware of them or may not trust them) (see also section 3.3). Consumers and micro-enterprises will tend to pay the NPOs' high published prices. Small and medium enterprises may obtain somewhat discounted prices (FTI, 2011), but how large the volume of shipments must be to qualify varies between member states, and what level of discounts might be obtained is, as with most aspects of this very opaque market sector, unknown.

Alternative shippers exist, but they typically lack the scale economies of the universal-service postal services. Some may provide national coverage, but others might prefer to 'cherry pick' high-density areas where the economics are more favourable.

For low-density areas, a strong analogy to telecommunications economics can be made. It

is typically only the historic national operator that has both the obligation and also the scale economies that enable and require it to provide services. In dense urban areas, by contrast, competition can be strong.

1.3 Why inflated prices matter

Inflated prices for cross-border delivery impact Europe in many ways:

- For B2C shipments, if the price of cross-border shipment is inflated, this price will ultimately be paid by the consumer one way or another and is likely to depress demand⁵. Purchases that might have been made but were not because of over-pricing⁶ represent a welfare loss to European society.
- Consumers might look only on domestic websites instead of checking websites in other member states because they (rightly or wrongly) fear high delivery charges. Analogously, small senders might decline to offer services in other member states because they lack the knowledge or scale needed to offer services there. In both cases, potential gains in trade are foregone if a better or less expensive product that could have been purchased is not in fact purchased⁷.
- European competitiveness is lost relative to the EU's global competitors. That SMEs are strongly impacted is particularly worrisome given that Europe is to some extent seeking to catch up with B2C providers elsewhere that were quicker than European firms to capitalise on e-commerce opportunities. European firms seeking to achieve market entry in the face of competition from global giants like Amazon should not be needlessly hobbled by Europe's own postal pricing arrangements.
- Senders might be obliged to warehouse goods at more locations than would have been necessary if prices were more reflective of underlying costs⁸. This again represents a competitive disadvantage in comparison to other regions of the world.

4. By NPOs we mean the historic incumbent postal operators, generally the firms that are subject to universal service obligations; in many member states, however, parcel delivery is not treated as a universal service.

5. This effect would operate through the *price elasticity of demand*. It is sometimes argued that the price that the consumer pays to the retail shipper is irrelevant because retailers offer free or discounted delivery. It is indeed fair to assume that the explicit delivery charge that the consumer sees does not necessarily bear much of a relationship to the (unknown) price paid by the retailer to the delivery service (see for instance Okholm et al, 2016, pages 21-24.). This is however rather beside the point. The retailer will consider the true costs of shipping goods when it determines the price of the goods sold.

6. To an economist, this can be understood as a *deadweight loss*, and can be analysed using *Harberger's Triangle*.

7. The desire to obtain these gains in trade is the reason why countries seek free trade agreements.

8. It is sometimes argued that goods are not necessarily shipped from the country associated with the website (see Okholm et al, 2016, page 11: "In fact, a large share of online transactions that are perceived as domestic by consumers involve a cross-border element"). This is correct, and reflects a beneficial cost optimisation on the part of the shipper, but is somewhat irrelevant to the concern that fulfilment centres are not necessarily placed where they would be if the delivery were fully reflective of cost.

2 TELECOMMUNICATIONS CASH FLOWS VERSUS PARCEL DELIVERY CASH FLOWS

A good starting point for an examination of the economics of cross-border parcel delivery is the well-understood economics of cross-border telecommunications. These similarities seem clear to us, but seem not to be obvious to the relevant regulatory authorities. A 2015 joint report of the Body of European Regulators for Electronic Communications (BEREC) and the European Regulators Group for Postal Services (ERGP), for instance, argued that “the contract for an international roaming service is between the consumer which originates a call/SMS or uses data and their mobile service provider, [while] the contract for an intra-EU cross-border parcels service is between the online retailer or sender of the parcel and the parcel delivery operator”⁹. In fact, the cash flows for parcel delivery are similar to those of many telecommunications applications, and are nearly identical to those of Internet content delivery.

It is easier to demonstrate this similarity in terms of telecommunications interconnection than in terms of the rather messy arrangements for international mobile roaming. In the case of telephony, the calling party pays for the call at a retail rate. In most of the world, the receiving party typically does not pay. The network that serves the calling party (the originating network) makes a payment at wholesale level to the network that serves the receiving party (the terminating network), which would otherwise receive no explicit revenue for the call¹⁰.

This basic model was expanded in 2003 to deal with Internet interconnection (Laffont *et al*, 2003). Different Internet Service Providers (ISPs) are assumed to serve websites and ‘eyeballs’ (consumers), respectively, thus taking an approach broadly in line with subsequent analysis of the economics of two-sided markets (Rochet and Tirole, 2004). Here, the consumer who receives content sometimes makes a direct payment to the website (a micropayment). The website and the consumer each make retail payments to their respective ISPs. Payments between the ISP that serves the website and the ISP that serves the consumer were the main focus

Laffont *et al* (2003), although they are not very common today¹¹.

It should be obvious that the flow of payments when goods are ordered for physical delivery by the national postal operators (see Figure 3) is much the same as the flow of payments when services are ordered for delivery over the Internet, except that the recipient of the parcel typically does not pay the parcel service for receiving it (similar to the telephony example in Figure 1); rather, the payment flows to the retailer or sender of the parcel. This payment plays precisely the same role as a micropayment to a content website (Figure 2). In fact, the sender in these two examples might be the same firm – if one chooses to order video content from, for example, Amazon, one might choose between streaming video over the Internet versus physical shipment of a DVD. The amount paid will be different in the two cases, but it is the same retail merchant, the same payment channel, and largely the same flow of payments (with ISPs taking the place of national postal operators).

The literature on cross-border parcel delivery rightly notes that many retailers do not explicitly charge for domestic shipping¹². It should however be clear from Figure 3 that the aggregate payment from consumer to retailer is what matters for most purposes, not how the payment is structured. One can reasonably assume that the retailer structures its retail prices in such a way that it recuperates (on average) its costs, including the cost of shipping.

For the most common postal (cross-border) services, payments between postal operators are referred to as terminal dues (TDs). Terminal dues are relevant not only for letters, but also for small parcels (less than 2 Kg) delivered as letter post. Inward land rates (ILRs) are the wholesale payments between NPOs for heavier parcels of between 2kg and 20kg (up to 31kg in some countries).

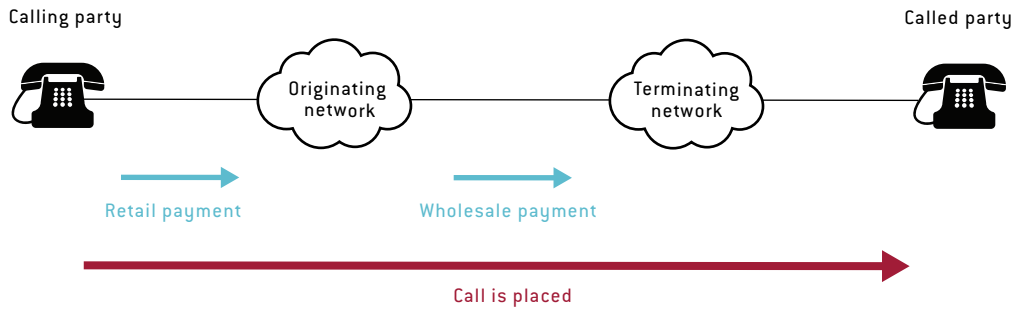
9. BEREC/ERGP (2015), page 14. They advance other equally unpersuasive arguments.

10. Laffont *et al* (1998a); Laffont *et al* (1998b); and Armstrong (1998).

11. Since the consumer’s ISP receives retail revenue (often at a flat rate), unlike the network of the called party, and since usage-based costs tend to be low, the wholesale payment is not essential here.

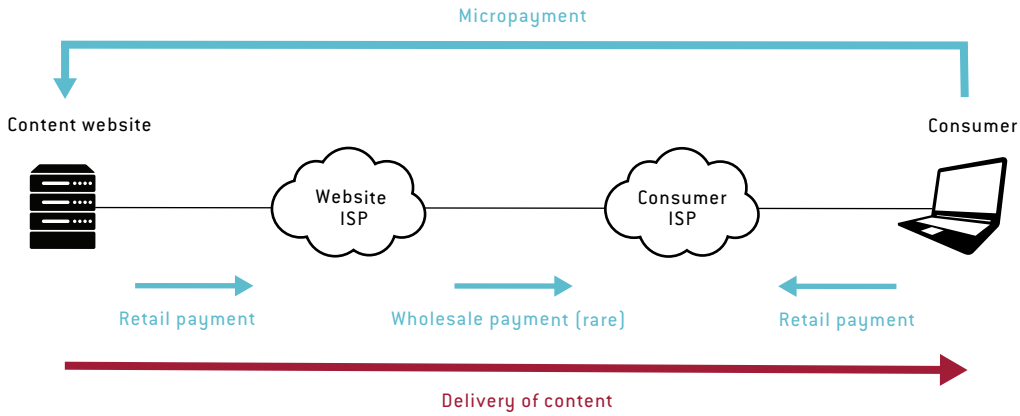
12. See for instance Okholm *et al* (2016), pages 21-24.

Figure 1: Cash flows for telephony interconnection



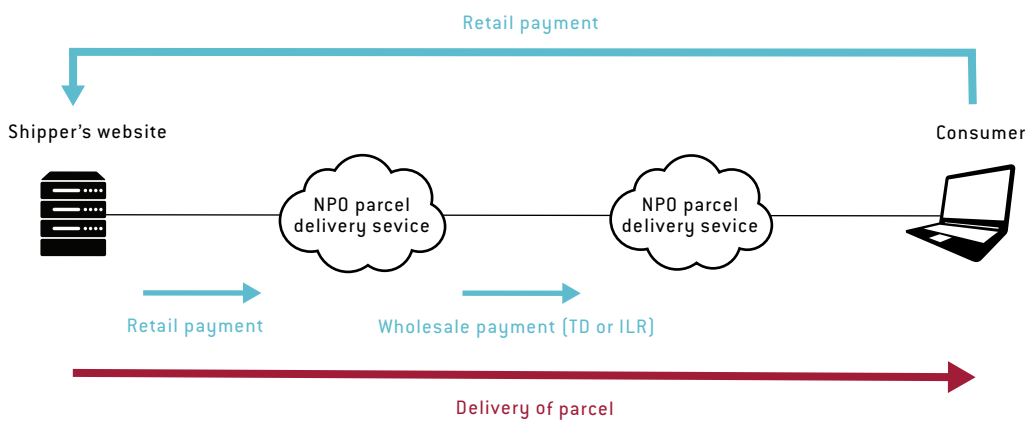
Source: Bruegel.

Figure 2: Cash flows for Internet interconnection



Source: Bruegel.

Figure 3: Cash flows for parcel delivery



Source: Bruegel.

3 ARE CROSS-BORDER PARCEL DELIVERY RETAIL PRICES INFLATED?

3.1 Domestic versus cross-border delivery

In assessing the costs of cross-border delivery, it is important to bear in mind that the NPOs have significant additional work to do for cross-border delivery in comparison to domestic delivery. Some of this extra work relates to the distance over which the parcel has to be shipped, but much more of the extra work relates to relabelling and otherwise mapping one NPO's services and processes to those of another. These re-mapping costs are largely unknown, but might be quite substantial.

This extra work means that it is legitimate for cross-border prices to be somewhat higher than domestic. The question is how much higher?

It is clear that cross-border delivery involves a longer chain of operations than domestic delivery, and therefore more cost. For domestic delivery, the chain of operations can be conceptualised as shown in Figure 4.

For cross-border delivery, the transport operation is more extensive, and additional steps are required (Figure 5); therefore, the cost to the delivery service is likely to be greater and it should consequently be no surprise if the price is set somewhat higher. Other factors could also contribute to legitimately higher costs than for domestic delivery, including different labour rates or currency exchange fluctuations.

We also note that most NPOs offer either a single retail price for parcel delivery to most of Europe, or some other aggregation of prices. Consumers generally appreciate the simplicity of these arrangements. In comparing prices, however, this can lead to counter-intuitive border effects – the price of shipping a parcel to an adjacent country is often much higher than the price for shipping the same parcel to a more distant location in one's own country. These border-effect price differences should be viewed, other things being equal, as legitimate.

3.2 Consumers and retailers are concerned about cross-border delivery prices

From the perspective both of those that already conduct e-commerce across borders, and those that do not, there is no question that the cost of cross-border parcel delivery is perceived as a problem.

Eurostat (2015) conducted a comprehensive survey of businesses in 2015. Among firms already conducting e-commerce on a cross-border basis (or that did so in the past), 51 percent said delivery prices were too high when selling to other EU countries, and 27 percent said this was a "major problem". Among companies that did not sell online to other EU countries but were trying to at the time of the survey, 62 percent said that high delivery costs were a problem, and 41 percent considered these costs a "major problem". Of firms not selling online, 57 percent said that delivery costs were too high, and that this was a major problem.

Significantly, for all three groups, high delivery costs were perceived as the most serious single barrier to cross-border e-commerce.

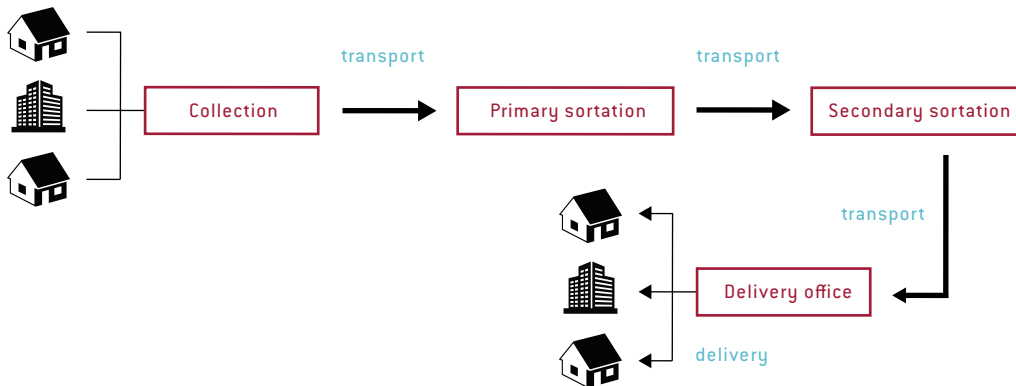
3.3 Results from the literature

FTI Consulting (2011) attempted a comprehensive assessment for the European Commission of whether wholesale and retail parcel delivery prices were inflated.

A first key finding was that:

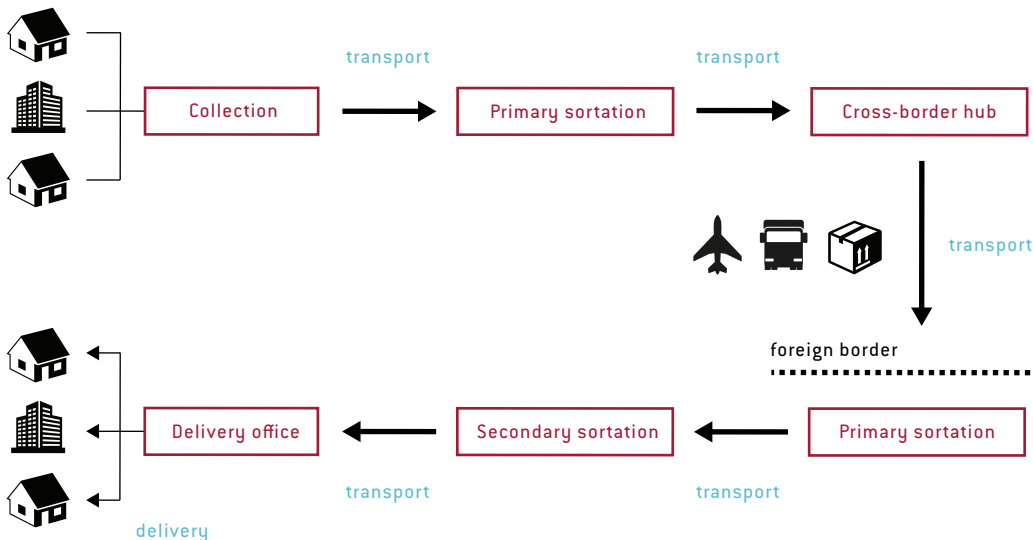
"... market conditions are very different for large and small senders. Large senders operate in a competitive European cross-border parcels environment, and have much choice and bargaining power vis-a-vis suppliers. The prices they pay are negotiated. By contrast, many small senders tend to use the services of national postal operators, even in cases where they do have alternatives. As a result, they pay higher cross-border prices, as compared to domestic ones. These higher prices could be due to higher cross-border unit costs linked to the smaller scale of cross-border operations; and/or to insufficient competitive pressure, ie to the existence of market power."

Figure 4: Steps in domestic postal delivery



Source: FTI (2011).

Figure 5: Steps in cross-border parcel delivery



Source: FTI (2011).

FTI (2011) concluded, after correcting for factors that make cross-border delivery more costly than domestic, that:

“... cross-border prices are indeed much higher than domestic benchmark prices and therefore too high. For parcels, they are on average twice as high as domestic benchmark prices, while for packets, which are part of letter mail, they are about 30 percent higher.”

Claes and Vergote (2016) carried out another econometric study for the European Commission in late 2015. They found that “on average, cross-border prices are 324 percent higher than their domestic counterpart for letters and 471 percent

higher for parcels”. Based on our own assessment (see section 3.4), the 471 percent may possibly be too high.

It is worth noting that both of these studies, and our own assessment as well (see section 3.4), share the limitation that substantially all research on postal retail and wholesale price characteristics has been based on published list prices, despite the lack of data on how many firms actually pay these prices, how different they are from the discounted prices actually paid, and the actual sources and destinations of parcels shipped.

3.4 An assessment based on published retail prices

It is clear based on underlying cost considerations that retail prices for cross-border parcel delivery should be higher than domestic, but how much higher?

This question has been explored several times by means of econometric analysis, but a first order review of retail prices in a range of member states¹³ (even at some risk of over-simplification of a complicated space) can provide a different and complementary view.

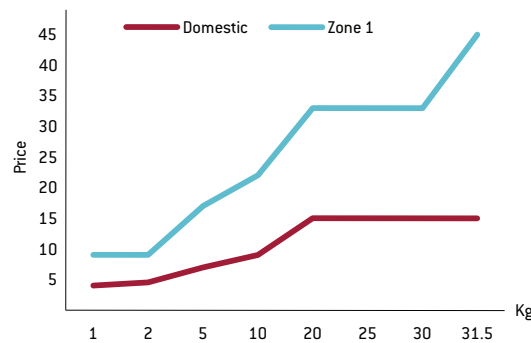
Figures 6 and 7 show the price per kilogramme for domestic and cross-border parcel delivery for a large central European country, Germany and a smaller peripheral one, Greece¹⁴. These two member states have substantially different published postal pricing arrangements.

A first characteristic that is evident is that cross-border rates are higher than domestic – from twice as high to three times as high in the upper weight categories in Germany, but an order of magnitude higher in Greece.

A second and rather surprising characteristic is that, while domestic prices are roughly linear as a function of weight, cross-border prices show a definite upwards tendency with increasing weight (ie the second derivate is positive). This is not what one would expect – if labour costs predominate, then costs should be driven more by the number of items than the weight, and the curve should slope downwards, not upwards¹⁵.

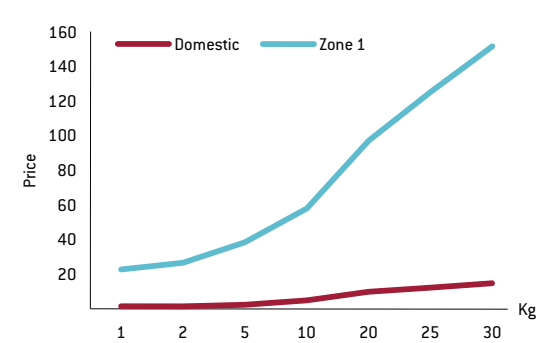
The ratio between cross-border delivery prices and the equivalent domestic prices (bearing in mind however that the services are not perfectly equivalent) differs greatly between Germany and Greece, and is also a function of the weight of the parcel (Figure 8). The difference is far smaller in

Figure 6: The NPO's published price in Germany (€/kg)



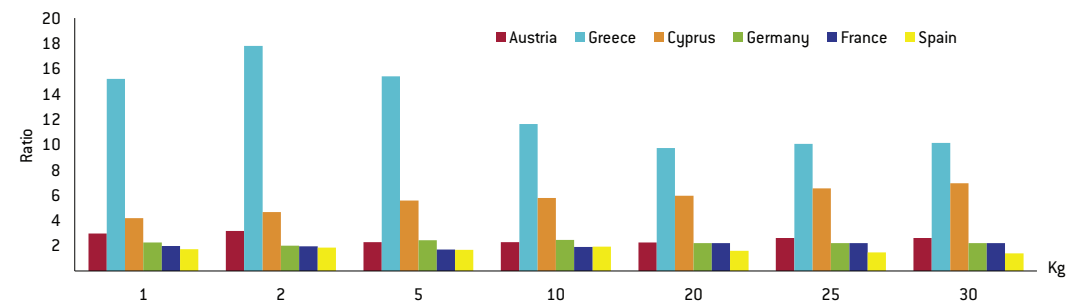
Source: Bruegel.

Figure 7: The NPO's published price in Greece (€/kg)



Source: Bruegel.

Figure 8: Ratio of NPO European cross-border parcel delivery prices to equivalent domestic prices in selected member states (by kg)



Source: Bruegel

13. All prices are based on a review of NPO websites during the first four months of 2016.

14. For cross-border parcel delivery, we looked at prices for the countries often referred to as 'Zone 1' (delivery within EU from Germany and Greece).

15. The finding is, however, consistent with Claes and Vergote (2016).

Austria, France, Germany and Spain than in Greece or Cyprus¹⁶.

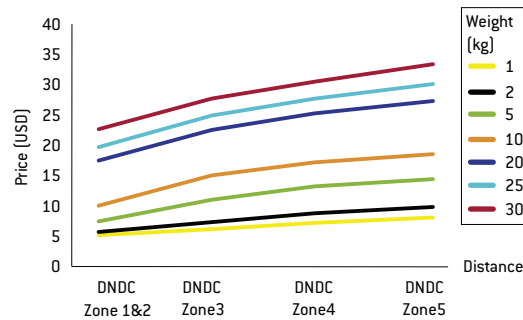
A comparison with parcel delivery prices in the United States is also instructive. The United States is not hugely different from the European Union as a whole in terms of population, area and GDP per capita, but it is a single federal republic that has had a single national postal service since it was founded¹⁷. Prices for parcel delivery within the United States thus serve as something of a benchmark of what one might expect if European postal service prices were a true reflection of underlying costs, and in the absence of the transaction costs imposed by re-mapping of services from those of the sending NPO to those of the receiving NPO¹⁸.

US prices for domestic delivery of 'machinable' parcels (ie parcels with fairly standard dimensions and falling within prescribed weight limits) show a fairly smooth curve within each weight category from zone 1 (closest to sender) to zone 5 (furthest from the sender)¹⁹. This is very different from Europe, where prices jump sharply when the first national border is crossed.

It is instructive to note that published United States Postal Service (USPS) prices include discounts for various forms of bulk mail, including for *instance a rate for "periodicals and standard mail that is properly prepared and entered by the mailer at the [post office, station or branch] that serves the delivery address on the mail"*, and also discounted rates for mail delivered in bulk to a post office that is pre-sorted based either on the first three digits or five digits of the postal zip code. The details are somewhat byzantine, but it is striking that discounted arrangements are published and consistent across the United States.

It is difficult to make valid US-EU comparisons because the services are not exactly like for like, and for many other reasons; however, Figure 10 attempts a rough comparison. Each of the six panels shows selected EU member states in ascending order by the domestic price for a 1kg parcel. The left-hand panels show the NPO's published price for domestic delivery within each of the selected member states for different parcel weight categories; the right-hand panels show

Figure 9: USPS price (in \$) for domestic parcel delivery to zones 1 (closest) to 5 (furthest), by weight (kg)



Source: Bruegel.

each NPO's published cross-border price for delivery to other member states (either to those that are nearby, or to all EU member states)²⁰.

For comparison, we also show in each panel the most nearly comparable US Postal Service (USPS) price.

Figure 10 shows that domestic EU prices appear to be somewhat comparable to US prices for short distances, but with a wide range of variation depending on the member state. For 1kg parcels (and noting that that parcels of up to 2 Kg may represent as much as 90 percent of all parcels), relatively low domestic parcel delivery prices are found in countries that have low labour costs (such as Greece and Cyprus), and also in some of the larger economies such as Germany (presumably thanks to economies of scale). For 1 Kg parcels, the published price for domestic delivery in Greece is 34 percent of the comparable USPS price, while prices in Italy and in the UK are 221 percent and 346 percent, respectively, of the US price²¹.

For cross-border prices, the spread is far greater, and all EU prices are higher than the corresponding US benchmark –some are much higher. The published price in Germany for cross-border delivery of a 1 Kg parcel is 1.43 times greater than the US benchmark comparison price. Published prices in other member states are at least twice the US comparison price. Published prices in Spain, Italy and the UK are respectively as much as 4.71, 6.27

16. This is consistent with an observation in FTI (2011) that economic distortions are less significant in the six largest member states than in many others. The coefficient of variation in these six countries (ie the standard deviation divided by the mean, which provides a normalised measure of variability) ranges as a function of weight from 0.81 to 1.19, which is quite large.

17. There are also competitors that offer nationwide parcel delivery service, such as UPS.

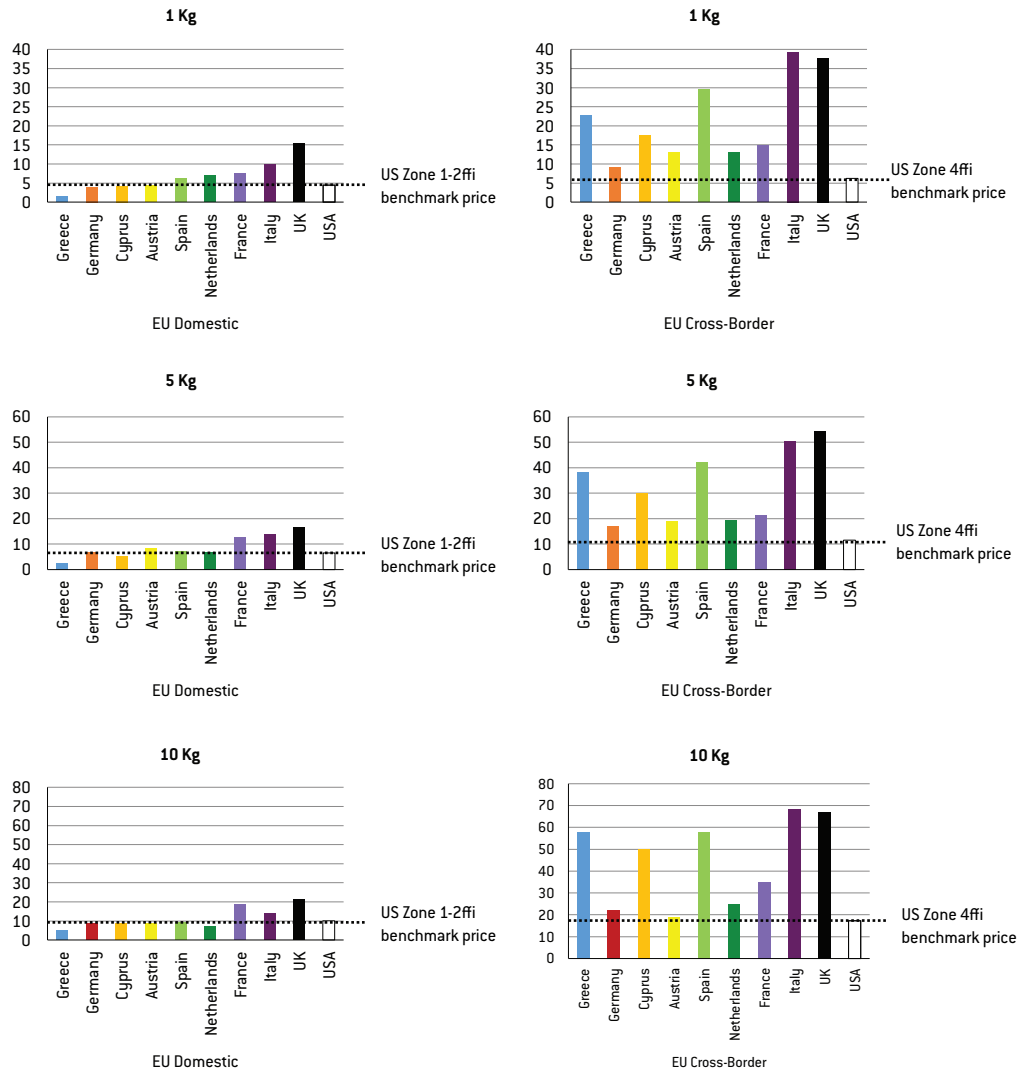
18. We acknowledge that there are limitations in these comparisons. First, there are challenges in comparing services that are not quite identical. Also, some claim that US postal prices are low by global standards. Nonetheless, the rough comparison is close enough to enable indicative comparisons.

19. Zones (reflecting distance from the sender) in the US range from 1 through 5.

20. We generally use prices to Zone 1, subject however to the caveat that Zone 1 is defined differently in each member state.

21. Based on €/€ exchange rates as of the first week of May 2016.

Figure 10: Comparison of EU domestic and cross-border published retail prices to roughly comparable US postal service published prices (2016, USD)



Source: Bruegel. Note: for domestic prices, we take USPS Zone 1 – 2 prices [covering distances of up to 150 miles or roughly 241 kilometres] as the benchmark. For cross-border prices, we take USPS Zone 4 prices [covering distances of up to 600 miles or roughly 966 kilometres] as the benchmark. Note that Zone 5 prices (up to 1000 miles) are not much different – they are 8 percent to 13 percent higher than Zone 4, depending on the weight of the parcel.

and 6.02 times as great. By any measure, these are large differences.

4 ARE CROSS-BORDER PARCEL DELIVERY WHOLESALE PRICES PROBLEMATIC?

Rather little has been written about wholesale payments between postal providers. There is an intriguing, though small, literature on the economics of postal cross-border wholesale payments [see sections 4.2 and 4.3].

4.1 What one might have expected based on experience with roaming

The economics of international mobile roaming²² and the related economics of telecommunications interconnection²³ provide useful insights relevant to the postal sector. Prior to the Roaming Regulation of 2007²⁴, (1) wholesale charges²⁵ were greatly in excess of real wholesale costs [representing a huge profit for the visited network]; (2) these wholesale charges effectively set a floor for the retail price, since they represented a real cost

22. See for instance Marcus and Petropoulos (2016); Imme Philbeck *et al* (2012); and Marcus *et al* (2015).

23. See Laffont *et al* (1998a); Laffont *et al* (1998b); and Laffont *et al* (2003).

24. The original Regulation was 'Regulation (EC) No 717/2007 of the European Parliament and of The Council of 27 June 2007 on roaming on public mobile telephone networks within the Community and amending Directive 2002/21/EC'. It was amended in 2009, 2012, and most recently with Regulation 2015/2120. With international mobile roaming, a mobile phone subscriber places or receives calls or SMS messages or uses mobile data services in a country other than the country in which he or she has his subscription.

25. Prior to regulation in 2007, wholesale charges were roughly €1.00 per minute for calls made, and retail prices roughly €1.30 per minute (Stumpf, 2001).

to the network that provided the retail service (ie the home network); and (3) retail mark-ups over the wholesale charge that have tended to be in the range of 30 percent, both before and after regulation, compounded the problem of high prices because they were effectively in addition to the already high wholesale charge (Figure 11).

It would be natural to assume that the same should hold for cross-border parcel delivery, and some of the literature makes this assumption. For instance, FTI (2011) assumed that excessive wholesale payments (TD rates) contributed to high retail prices. Surprisingly, this seems not to be the case. Instead, as we have shown, wholesale TD rates seem to be not too high, but rather too low.

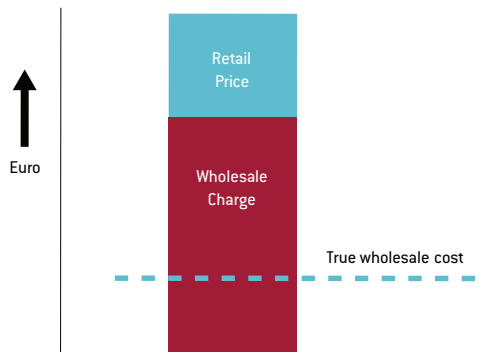
Given that the structure of payments in the two cross-border activities is roughly the same, it is surprising that the outcomes should be opposite. The difference appears to be linked to the fact that NPOs are under no obligation (thanks to UPU rules) to make their services available to domestic competitors, nor to foreign competitors who are not NPOs. There is a *de-facto* geographic partitioning²⁶.

4.2 Wholesale TD prices appear to be not too high, but rather too low

The structure of TD and ILR wholesale prices is documented by the UPU, but specific rates do not appear to be publicly visible anywhere. Despite the dearth of publicly available information, there is nonetheless good reason to believe that TDs are below a reasonable estimate of NPOs' marginal costs. ILRs have been less studied, and in any case represent a relatively small fraction of total parcel volume, so we say little about them here.

As a threshold question, one needs to consider what the appropriate price should be. The TD should presumably cover the costs of delivery, but not of collection, in the destination country. (For international traffic, collection is performed in the sending country, not in the destination country). The UPU generally assumes that 70 percent of the domestic postal rate is a reasonable proxy for the cost of delivery, which seems fairly reasonable. We follow their practice here.

Figure 11: Relationship between wholesale cost, wholesale charges, and retail price for mobile roaming



Source: Bruegel.

There are signposts that TDs are not too high, but rather too low, in:

- The limited literature on this complex topic;
- The presence of a remailing industry, and the need to use UPU rules to suppress it;
- Periodic complaints that foreign senders (eg from China) can ship goods to Europe for less than European firms.

First, the literature definitely leans in the direction of TDs being too low. Even at the time of the Commission's 1987 Postal Green Paper (European Commission, 1987), it was already recognised that "*most member states find that their unit costs for delivering [inward cross-border] traffic are not covered*".

James R. Campbell Jr. has tackled the question in numerous studies²⁷. He argues consistently and persuasively that TDs are set well below the nominal cost benchmark of 70 percent of the equivalent domestic price (EDP).

Two studies by Copenhagen Economics on behalf of the US Postal Regulatory Commission (US PRC) explain the TD system and attempt to estimate the adverse impact on societal welfare that flows from non-cost-based TDs. They found that "*terminal dues received often are lower than the prices for last-mile handling of domestic (and comparable) letter post items in the receiving country*" (Okholm et al, 2014 and 2015).

26. The difference might also reflect the preferences of developing countries, who represent the majority of UPU members, and might moreover reflect the fact that in the distant past, there were no charges at all.

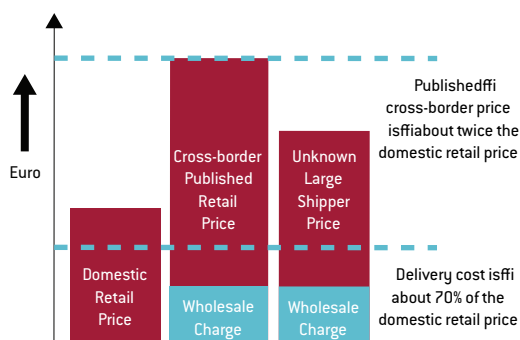
27. See for instance Campbell (2014a) and especially Campbell (2014b).

The second clue to below-cost TDs is the presence of a remailing industry, and the need for the UPU to implement rules to hinder it. Remailing has been around for a long time. The European Commission's 1987 Postal Green Paper defined remailing as "a cross-border mail service offered by private operators in competition with the services offered by the postal administration in the country of the customer. ... [One] type of remail involves mail being transported from country A to country B for remailing back to country A".

Economic distortions must be present if it is cost-effective to deliver a parcel from country A to country A (in effect a domestic delivery) by shipping it outside the country and then shipping it back. This can only be profitable if the international charge for inward traffic is less than the internal cost. Examples of this kind of arbitrage are well known in the world of telecommunications (where it is known as 'tromboning', and occurs only when international termination rates are less than domestic termination rates and/or on-net termination costs)²⁸.

Complaints that Chinese senders can ship goods to developed countries at lower cost than merchants within the respective countries are an additional indicator, and a confirmation that this is not merely a historical curiosity²⁹. Again, this could only be the case if TDs are artificially depressed.

Figure 12: Relationship between wholesale cost, wholesale charges and published retail price for parcel delivery by an NPO



Source: Bruegel.

4.3 Implications for retail services of low TD wholesale payments

To the extent that these TD wholesale payments might tend to be below relevant marginal costs, the implications for retail prices are profound. Recall that:

- FTI (2011) found that published prices for cross-border parcel delivery "are on average twice as high as domestic benchmark prices", while Claes and Vergote (2016) found that "on average, cross-border prices are ... 471 percent higher [than their domestic equivalents] for parcels" (see section 3.3).
- The cost that the sending network operator incurs for delivery, which would normally be expected to be on the order of 70 percent of the domestic price, is even less in this case because the TDs are depressed thanks to UPU rules (see again section 3.3).

In terms of retail prices paid by individual consumers, this leads inescapably to the conclusion that the mark-up for those who are obliged to purchase at published prices must be very high.

Figure 12 depicts this. The left column represents the published retail price that consumers pay to ship a parcel domestically. The actual cost of delivery is assumed, consistent with UPU assumptions, to be 70 percent of the published domestic price. For inward parcels, this same cost is assumed. The lower dashed line can thus be viewed as representing the true cost of delivery, which is the cost that the TDs are presumably meant to cover. Note that this cost is incurred by a different postal service, and in a different country, than the postal service that receives the retail revenue.

The middle column of Figure 12 depicts both the wholesale payment that the sending postal operator makes to the receiving postal operator (the red rectangle), and the total retail revenue that the sending postal service receives (the height of the blue column). The retail revenue at published prices is at least twice as great as in the case of domestic parcel delivery. On the other hand, the height of the red rectangle is actually less than the cost of delivery to the receiving postal service.

28. An analogous form of arbitrage came into play in conjunction with the low value consignment rule exemption from VAT, under which magazines were printed in Denmark, then shipped to the Åland Islands (Finland) and shipped back to Denmark in order to avoid paying Danish VAT.

29. See for instance Guo (2014) and Steiner (2016). The issue is by no means confined to the United States.

The difference between the height of the blue column and that of the red column is then a measure of the postal service's profit (ie the mark-up of retail over wholesale). One must however bear in mind that the wholesale TD payment is not the only cost that the sending postal service incurs. In addition to the adaptation and labelling costs, there is also the transit of the parcel to the destination country, and probably also an additional sortation step. It is quite unlikely that these costs fully account for the wholesale-retail mark-up, but they should not be ignored.

If the retail published price for cross-border delivery is twice as much as for domestic delivery, but the cost to the sending postal service is less than it would have incurred to deliver the parcel itself domestically, then it would appear that the difference or 'spread' between price and cost is (assuming that other costs such as transaction costs and transit are not too great) far greater than for domestic parcel delivery.

The right column of Figure 12 depicts the situation for large senders. The wholesale cost to the receiving postal service is presumably largely independent of whether the original sender was large or small, and the TDs paid are likewise unlikely to depend on who the original sender was; however, the retail price will tend to be lower, and therefore the mark-up of retail over the wholesale TD will also be correspondingly lower. How much lower? Amazingly little is publicly known about this.

5 SIMILARITIES AND DIFFERENCES COMPARED TO INTERNATIONAL MOBILE ROAMING

There are significant similarities, but also noteworthy differences, when it comes to prices for parcel delivery and international mobile roaming. Among the similarities:

- Because of the cross-border nature of the service, and the fact that it is offered in two different countries, prices lack transparency and tend to be high.
- That retail markets in the countries in question may be competitive has little or nothing to do with whether these cross-border services are over-priced.

- The linkage between wholesale and retail prices is crucial in understanding any price distortions, and also in understanding the likely impact of any regulatory intervention.
- Prior to regulation, hardly anything is publicly known about wholesale prices.
- National regulatory authorities are limited in both their ability and their level of interest in addressing the problem.
 - Every interaction involves two countries, but each lacks both authority and information about the problem in the other country.
 - No national regulatory authority has an incentive to take action that harms the domestic incumbent in order to benefit residents of another country.
- Member states and NPOs that are net exporters (and thus net payers) may have incentives that are very different from those that are net importers of traffic.
- For telecommunications, action at European level has been highly effective.

Here the similarities end. For roaming, high pricing was largely the result of high wholesale prices between the mobile network operators (MNOs), which were exacerbated by significant additional high mark-ups above the level of the wholesale payment³⁰. Regulatory price caps on both wholesale and retail prices proved to be effective.

For cross-border parcel delivery, if wholesale prices are indeed too low rather than too high, there are implications for what kind of regulatory solutions might work, and what kind might not. If the diagnosis is different than for roaming, the cure is also likely to be different.

For cross-border parcel delivery, if one accepts that there is a problem, it lies not with the absolute level of wholesale charges, but rather with the very large 'spread' between the retail price charged to individuals and micro-enterprises versus the low level of TD wholesale payments (see Figure 12).

One could consider regulatory measures to reduce this spread. If a direct regulatory intervention were to be deemed necessary at some point

30. The combined effect of taking mark-ups on both vertically related services is referred to as 'double marginalisation' or 'pancaking'.

(on which we do not venture an opinion), an obvious candidate would be to make the TD wholesale price arrangements available for the first time to delivery services other than NPOs. If multiple delivery services could utilise the NPOs' delivery networks at prices that were non-discriminatory relative to those that the NPO provides itself, the spread should in principle fall to levels consistent with competitive forces.

The obvious risk in any strategy along these lines is that, if done without a simultaneous corresponding adjustment to the (currently below nominal cost) TD rates, it would be likely to lead to quite massive arbitrage. Each NPO's competitors would have access to the NPO's delivery network at a price that is in some sense below the cost of that service to the NPO itself, and could therefore beat the NPO on price even when using the NPO's own network to deliver.

The implication is clear. Any attempt to correct the spread would need to address the apparent systematic under-pricing of wholesale TDs. Doing so is unlikely to succeed without a better understanding of economic flows among the NPOs, which implies a strong need for a greatly improved base of statistics³¹.

6 RECOMMENDATIONS

A clear and unavoidable first step in our judgment is to gather, at long last, real data on the problem. Today, hardly anything is known, either to the public or to national and European regulatory authorities, about: 1) actual wholesale payments made among national postal operators; or 2) effective prices paid by senders other than individual consumers.

The position of EU authorities in this regard is not very different from that of EU and national regulatory authorities of electronic communications before enactment of the 2007 EU Roaming Regulation of 2007. No systematic data was available then either. A fundamentally European problem had been analysed, to the extent that it was analysed at all, in a fragmented way at national level. In this regard, the statistics collection that has been conducted by European telecommuni-

cations regulators is a model that the postal sector could adopt (see for instance BEREC, 2016).

Many options are available for European policy on cross-border parcel delivery, but good statistics at both wholesale and retail level are critical for all of them:

- European and national regulators need good statistics to forecast and evaluate the impacts of any measures.
- If the intent is to drive prices down through greater transparency, then statistics are obviously central to the effort.
- If one were to attempt a 'hard' regulatory solution, statistics are even more crucial in order to understand and prevent harmful forms of arbitrage that might result (see section 5).

A 2015 joint report of the Body of European Regulators for Electronic Communications (BEREC) and the European Regulators Group for Postal Services (ERGP) rightly noted that not all European postal regulatory authorities have statutory authority to collect data on retail prices. They therefore suggested that the European Commission might "*define a clear statistical framework*" and "*provide a legal basis to enable [national regulatory authorities] to collect relevant market data on domestic and cross-border parcel flows from all postal service providers and/or other providers being active on the B2C and Business-To-Business (B2B) parcel markets ...*".

However, this recommendation does not go far enough. Merely empowering national postal regulatory authorities to collect such data will with high probability lead to:

- Collection of data by only a handful of postal authorities, if that;
- Inconsistent data collection, and thus limited ability to compare data; and
- No empowerment of any central authority that can gather the data from the individual postal authorities and analyse it.

We strongly recommend that member states be not only empowered, but also required, to collect data on retail and wholesale arrangements³². The

31. It is conceivable that the NPOs would be forced to respond by raising TDs among themselves, and that everything would function effortlessly; however, given the complex inter-linked structures in the sector, it seems risky to assume that everything would function flawlessly without intervention at the present level of knowledge.

32. This is consistent with the recommendations of FTI (2011): "*The fact that little is disclosed about termination rates, so that [national regulatory authorities] may not be privy of them, is a clear problem for efficient regulation. We are not advocating that termination rates for USO deliveries should be public. They should not. They should, however, be disclosed to NRAs to allow them to discharge their regulatory duties ...*".

data should be in a consistent, pre-agreed format. An authority other than the postal regulatory authorities, presumably the European Commission, should oversee the standards developed in order to ensure that the data reported is likely to actually convey useful information about wholesale and retail arrangements between the national postal operators. Some central authority with sufficient independence and authority (presumably the Commission) should gather the data from national authorities, analyse it, and provide summary public reports³³.

REFERENCES

Armstrong, Mark (1998) 'Network Interconnection in Telecommunications', *Economics Journal* vol. 108: 545–564

BEREC (2016) *International Roaming: BEREC Benchmark Data Report, April – September 2015*, BoR (16) 28 Rev.1

Body of European Regulators for Electronic Communications (BEREC), and European Regulators Group for Postal Services (ERGP) (2015) 'Price transparency and regulatory oversight of cross-border parcels delivery, taking into account possible regulatory insights from the electronic communications sector: Joint BEREC-ERGP Opinion', BoR (15) 214

Brune, Didier (2013) 'E-Commerce and Opportunities for Cross-Border Parcels in Europe', presentation at the 14th Königswinter Seminar on Postal Economics

Campbell, James I Jr. (2014a) "Draft Proposals for the UPU Istanbul Congress – Terminal dues", available at www.state.gov/documents/organization/232813.pdf, accessed 14 May 2016

Campbell, James I Jr. (2014b) 'Estimating the Effects of UPU Terminal Dues, 2014 – 2017', 8th Bi-annual Postal Economics Conference on E-commerce, Digital Economy and Delivery Services, Toulouse

Certain Public Postal Operators (1997) *Agreement for the Remuneration of Mandatory Deliveries of Cross Border Mails (REIMS II)*

Claes and Vergote (2016) "Econometric study on parcel list prices", available at <http://ec.europa.eu/DocsRoom/documents/14647>, accessed 14 May 2016

E-commerce Europe (2015) *2014 Key B2C E-commerce Data of Goods & Services at a Glance*

EurActiv and Digital Europe (2016) 'How Digital is the EU in 2015?' available at http://www.digitaleurope.org/DesktopModules/Bring2mind/DMX/Download.aspx?Command=Core_Download&entryID=921&PortalId=0&TabId=353

European Commission (1987) *Green Paper on the Development of the Single Market for Postal Services*, COM(91) 476 final

European Commission (2013) 'Mergers: Commission prohibits proposed acquisition of TNT Express by UPS – frequently asked questions', available at http://europa.eu/rapid/press-release_MEMO-13-48_en.htm, accessed 14 May 2016

European Commission (2015) *A Digital Single Market Strategy for Europe*, SWD (2015) 100 final

Eurostat (2015) 'Companies Engaged in Online Activities: Report', *Flash Eurobarometer* 413

Eurostat (2016) 'E-commerce statistics for individuals', available at http://ec.europa.eu/eurostat/statistics-explained/index.php/E-commerce_statistics_for_individuals, accessed 9 April 2016

FTI Consulting (2011) *Community cross-border parcel delivery*, study for European Commission, Directorate General Internal Markets and Services

33. Confidentiality of commercially sensitive data of the designated operators poses serious challenges.

BEREC's data collection solves this problem by reporting summary statistics at national level. Since nearly all member states have either three or four MNOs, this does not unambiguously reveal information about individual firms. Since member states generally have only a single NPO, some refinement would be needed if the data is to be made public.

- Guo, Jeff (2014) 'The Postal Service is losing millions a year to help you buy cheap stuff from China', *Washington Post*, available at <https://www.washingtonpost.com/news/storyline/wp/2014/09/12/the-postal-service-is-losing-millions-a-year-to-help-you-buy-cheap-stuff-from-china/>
- Laffont, Jean-Jacques, Patrick Rey and Jean Tirole (1998a) 'Network Competition I: Overview and Nondiscriminatory Pricing', *RAND Journal of Economics* vol. 29: 1-37
- Laffont, Jean-Jacques, Patrick Rey and Jean Tirole (1998b) 'Network Competition II: Price Discrimination', *RAND Journal of Economics* vol. 29: 38-56
- Laffont, Jean-Jacques, J. Scott Marcus, Patrick Rey and Jean Tirole (2003) 'Internet Interconnection and the Off-Net-Cost Pricing Principle', *RAND Journal of Economics* Vol. 34: 370-390
- Marcus, J. Scott, Christin-Isabel Gries and Robert Clarke (2015) *International Mobile Roaming (IMR) across the Gulf Corporation Council (GCC) Region*, consultation and report prepared for the Gulf Corporation Council Roaming Working Group
- Marcus, J. Scott and Georgios Petropoulos (2016) 'International Mobile Roaming (IMR): Quo Vadis?', forthcoming, Bruegel
- Okholm, Henrik Ballebye, Anna Möller Boivie, Nina Russell and Jacek Przybyszewski (2014) *The Economics of Terminal Dues: Final report*, Copenhagen Economics, prepared for the US Postal Regulatory Commission, available at: http://www.prc.gov/sites/default/files/reports/The%20Economics%20of%20Terminal%20Dues_final%20report%20300914.pdf
- Okholm, Henrik Ballebye, Anna Möller Boivie, Simon Edkins and Jimmy Gårdebrink (2015) *Quantification of financial transfers caused by Universal Postal Union terminal dues: Final report*, Copenhagen Economics, prepared for the US Postal Regulatory Commission, available at: http://www.prc.gov/sites/default/files/papers/Quantification%20of%20financial%20transfers%20caused%20by%20Universal%20Postal%20Union%20terminal%20dues_final%20report.pdf
- Okholm, Henrik Ballebye, Anna Möller Boivie, Julia Sabine Wahl, Kristoffer Jensen, Alber Nygard and Bruno Basalisco (2016) *Principles of E-Commerce Parcel Prices*, Copenhagen Economics, prepared for PostEurop, available at: <https://www.copenhageneconomics.com/publications/publication/principles-of-e-commerce-delivery-prices>
- Philbeck, Imme, J. Scott Marcus, Jasper Mikkelsen and Werner Neu (2012) *Trans-Tasman Roaming: Service Costs*, a study for the Australian Department of Broadband, Communications and the Digital Economy and the New Zealand Ministry of Business, Innovation and Employment (MBIE)
- Rochet, Jean-Charles and Jean Tirole (2004) 'Two Sided Markets: An Overview', available at: web.mit.edu/14.271/www/rochet_tirole.pdf
- Steiner, Ina (2016) 'Online Sellers Fume over Low ePacket Postal Rates from China', *eCOMMERCE Bytes*, available at <http://www.ecommercebytes.com/C/blog/blog.pl?pl/2016/1/1453344622.html>
- Stumpf, Ulrich (2001) 'Prospects for Improving Competition in Mobile Roaming', *WIK Report* Nr. 232, Wissenschaftliches Institut für Infrastruktur und Kommunikationsdienste GmbH